

What is claimed is:

1. A wafer rotary holding apparatus comprising: a rotary disk on which a fluid flow path is formed; a through hole formed in a central section of the rotary disk; and a plurality of wafer rests  
5 provided on an upper surface of the rotary disk, wherein a wafer is placed on the wafer rests, above the rotary disk with a gap therebetween, and wherein when the rotary disk is rotated, a fluid in the fluid flow path is discharged outwardly by centrifugal force due to rotation; thereby a reduced pressure is created in the fluid flow path  
10 and kept as far as the rotary disk is rotated, through a process in which a fluid is drawn by sucking force of the reduced pressure from the lower surface side of the rotary disk through the through hole, and the fluid drawn is supplied onto the upper surface of the rotary disk to be outwardly discharged in a continuous manner passing  
15 through the fluid flow path, with the result that the wafer is drawn downwardly by the sucking force of the reduced pressure and fast held on the wafer rests while rotating.

2. A wafer rotary holding apparatus according to claim 1, further comprising: fluid forcible supply means supplying a fluid  
20 forcibly through the through hole from the lower surface side of the rotary disk, wherein the fluid is supplied through the through hole in a forced manner from the lower surface side of the disk while keeping the reduced pressure.

3. A wafer rotary holding apparatus according to claim 1 or 2,  
25 wherein straight or curved blades are provided in a radial state, or a

single curved blade is provided in a spiral or volute state on the upper surface of the rotary disk and the fluid flow paths or path is formed in spaces between the upper surface of the rotary disk and a lower surface of the wafer, being partitioned by pairs of opposed  
5 blades or blade portions.

4. A wafer rotary holding apparatus according to claim 1 or 2, wherein a rotary shaft through which a hollow section in communication with the through hole is formed along the axial direction thereof is vertically provided on the central section of the  
10 lower surface of the rotary disk and when the rotary shaft and the rotary disk are rotated, a fluid taken in by suction from a lower end opening of the hollow section of the rotary shaft is supplied onto the upper surface of the rotary disk passing through the hollow section and the through hole.

15 5. A wafer rotary holding apparatus according to claim 4, further comprising: pressure reduction control means controlling a reduced pressure in the fluid flow path by adjusting a degree of opening of the hollow section, mounted at a proper position along the rotary shaft.

20 6. A wafer rotary holding apparatus according to claim 1 or 2, wherein the wafer rests are constructed with lower side guide pins receiving the lower surface of a wafer and outer side guide pins receiving the outer side surface of the wafer.

7. A wafer rotary holding apparatus according to claim 3,  
25 wherein the wafer rests are placed on the upper surface of the

straight or curved blades, or the upper surface of the curved blade.

8. A wafer rotary holding apparatus according to claim 1 or 2, wherein a baffle plate is provided above the through hole formed in the central section of the rotary disk and a fluid supplied onto the upper surface of the rotary disk passing through the through hole is  
5 guided in a blade direction with the baffle plate.

9. A wafer rotary holding apparatus according to claim 1 or 2, wherein an orientation flat receiver receiving an orientation flat of the wafer is provided on the upper surface of the rotary disk.

10 10. A wafer rotary holding apparatus according to claim 1 or 2, wherein a notch receiver receiving a notch of the wafer is provided on the upper surface of the rotary disk.

11. A wafer rotary holding apparatus according to claim 1 or 2, wherein the fluid is a gas and/or a liquid.

15 12. A wafer surface treatment apparatus with a waste liquid recovery mechanism used for treating a surface of a wafer with each of a treatment liquid and a cleaning liquid, comprising: a wafer rotary holding apparatus holding a to-be-treated wafer while rotating; and a waste liquid recovery mechanism provided around the  
20 periphery of the wafer rotary holding apparatus in a vertically movable manner, wherein the waste liquid recovery mechanism is constructed of a plurality of annular waste liquid recovery troughs which are vertically movable relative to each other or one another and the annular waste liquid recovery troughs are selectively used  
25 according to kinds of the treatment liquid and the cleaning liquid,

such that the respective waste liquids are separately recovered.

13. A wafer surface treatment apparatus according to claim 12, wherein three annular waste liquid recovery troughs are employed.

5           14. A wafer surface treatment apparatus according to claim 12, wherein the wafer rotary holding apparatus according to claim 1 is employed.

          15. A wafer surface treatment apparatus according to claim 12, wherein the wafer rotary holding apparatus according to claim 2  
10 is employed.